

Claims

1. A device (1), in particular for transmitting a movement as well as corresponding forces and/or moments, comprising a drive (2) and a take-off (3), wherein the drive (2) and take-off (3) are coupled via at least one coupling element (4) in such a manner that in the decoupled state a movement of the drive (2) causes a movement of the coupling element (4), wherein said movement is not suitable for transmitting a movement from the drive (2) to the take-off (3).  
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2. The device according to claim 1, wherein the movement of the drive (2) in the decoupled state cannot be transmitted to the take-off (3) by the movement of the at least one coupling element (4) because the mechanical potential of the take-off (3) cannot be overcome.  
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3. The device according to claim 1 or 2, further comprising a coupling means (15) which can cause a coupling as well as a decoupling of the drive (2) and the take-off (3) by means of the at least one coupling element (4).  
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4. The device according to claim 3, wherein in the decoupled state the coupling means (15) is essentially not engaged with the at least one coupling element (4).  
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5. The device according to claim 3 or 4, wherein in the coupled state the coupling means (15) causes a limitation of the movability of the at least one coupling element (4).  
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6. The device according to any one of claims 3 to 5, wherein the coupling means (15) comprises at least one coupling locking device or coupling locking element (17) for limiting the movability of the at least one coupling element (4) in the coupled state.  
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7. The device according to claim 6, wherein a mechanical potential has to be overcome for moving the coupling locking element (17) from the decoupled state in a coupled state and/or from the coupled state in the decoupled state.

8. The device according to claim 6 or 7, wherein the cooperation between coupling locking elements (17) and coupling element(s) (4) is such that the forces applied by the at least one coupling element (4) cause a movement tendency towards a stronger and more reliable engagement, so that at the beginning of the force application there is only a partial engagement but then an essentially reliable position is reached.
9. The device according to claim 6, 7 or 8, wherein the coupling means (15) further comprises an actuator (16) for positioning the coupling locking element (17).
10. The device according to claim 9, wherein the actuator (16) is suitable for causing a displacement of the coupling locking element (17) via a mechanical potential into a position being suitable for coupling.
- 15 11. The device according to any one of claims 8, 9 or 10, wherein the actuator is bistable.
12. The device according to claim 9, 10 or 11, wherein the actuator (16) comprises an electromagnet arrangement having at least one yoke (26) and a coil (27).
- 20 13. The device according to any one of the preceding claims, wherein the coupling device is configured shock and manipulation resistant such that the movement directions of the coupling means (15) are essentially orthogonal with respect to the shock directions to be expected and/or counter-moments compensate for the forces caused by the shock.
- 25 14. The device according to any one of the preceding claims, wherein a mechanical potential has to be overcome for a relative movement between the drive (2) and take-off (3), wherein said potential is lower than a mechanical potential of the take-off (3).
- 30 15. The device according to any one of claims 6 to 14, wherein the potential leads to the fact that when the force at the drive (2) falls below a specific value, at least one

coupling locking element (17) can essentially be brought into and/or out of a coupling position without the application of a force.

16. The device according to any one of the preceding claims, wherein the drive (2) and  
5 take-off (3) are coupled via the at least one coupling element (4) in such a manner  
that in the decoupled state a movement of the drive (2) causes a movement  
component of the coupling element (4) being orthogonal thereto, and that a  
movement of the drive (2) in the coupled state essentially causes a movement of the  
coupling element (4) in the same direction.  
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17. The device according to any one of the preceding claims, wherein the drive (2) and  
take-off (3) are coupled via the at least one coupling element (4) in such a manner  
that in the decoupled state a movement of the take-off (3), with a stationary drive  
(2), causes a movement component of the at least one coupling element (4) being  
15 orthogonal thereto, and that a movement of the take-off (3) in the coupled state  
essentially causes a movement of the at least one coupling element (4) in the same  
direction.
18. The device according to any one of the preceding claims, wherein a movement of  
20 the at least one coupling element (4) being essentially orthogonal with respect to the  
movement direction of the drive essentially does not cause a movement of the take-  
off (3).
19. The device according to any one of the preceding claims, wherein a rotational  
25 movement of the at least one coupling element (4) essentially causes a rotational  
movement of the take-off (3).
20. The device according to any one of the preceding claims, wherein the at least one  
coupling element (4) communicates with the drive (2) via at least one first guide  
30 means (5, 7).

21. The device according to claim 20, wherein the at least one first guide means (5, 7) comprises at least one first slide surface (5) for a contact with at least one first slide element (7).
- 5 22. The device according to claim 20 or 21, wherein the at least one first slide surface (5) is inclined with respect to an axial movement direction of the coupling element (4).
- 10 23. The device according to claim 21 or 22, wherein upon a rotation of the drive (2), the at least one first slide element (7) being arranged at the drive (2) essentially moves on a plane being essentially perpendicular with respect to an axial movement direction of the at least one coupling element (4), wherein it contacts and/or moves along at least one first slide surface (5).
- 15 24. The device according to any one of the preceding claims, wherein the at least one coupling element (4) comprises at least one second guide means (6, 8) communicating with the take-off (3).
- 20 25. The device according to claim 24, wherein the at least one second guide means comprises at least one second slide surface (6) for a contact with at least one second slide element (8).
- 25 26. The device according to claim 25, wherein the at least one second slide surface (6) is essentially parallel with respect to an axial movement direction of the at least one coupling element (4).
- 30 27. The device according to claim 25 or 26, wherein upon a rotation of the at least one coupling element (4), the second slide element (8) being arranged at the take-off (3) essentially moves on a plane being essentially perpendicular with respect to an axial movement direction of the at least one coupling element (4), wherein it contacts and/or moves along at least one second slide surface (6).

28. The device according to any one of the preceding claims, wherein the take-off (3) for generating a mechanical potential communicates with at least one third guide means (10, 11).

5 29. The device according to claim 28, comprising at least one third guide means and at least one third slide surface (10) for a contact with at least one third slide element (11) being arranged in a guide (12).

10 30. The device according to claim 29, wherein the at least one third slide surface (10) is inclined with respect to a rotational axis of the take-off (3).

15 31. The device according to claim 29 or 30, wherein upon a rotation of the take-off (3), the at least one third slide element (11) being arranged in a guide (12) essentially moves along the rotational axis of the take-off (3).

20 32. The device according to any one of claims 29 to 31, wherein the at least one third slide element (11) is pre-stressed with respect to the at least one third slide surface (10).

25 33. The device according to any one of the preceding claims, wherein the coupling element (4) is pre-stressed with respect to the take-off (3) and/or with respect to the drive (2).

34. The device according to any one of claims 1 to 33, wherein the mechanical potential which has to be overcome for the movement of the take-off, essentially acts on the coupling element (4).

35. The device according to any one of claims 1 to 34, wherein the coupling element (4) can be pre-stressed by a spring element (21), which preferably comprises a torsion spring and/or a potential arrangement and wherein the coupling element (4) can preferably be limited in its angle of rotation.

36. The device according to claim 35, wherein the limiting of the angle of rotation is achieved by the co-operation of the take-off (3) and a stop (22).
37. The device according to any one of claims 1 to 13, 15 to 19 or 33, wherein the coupling element (4) consists of at least one roller element (23) or sliding element.
38. The device according to claim 37, wherein the roller element (23) or the sliding element is guided in the drive (2) in such a manner that it can essentially move in radial direction with respect to said drive.
39. The device according to claim 37 or 38, wherein the roller element (23) or the sliding element is pressed outwards by a spring element (24) preferably consisting of a leg spring.
40. The device according to claim 37, 38 or 39, wherein the take-off (3) is configured such that it comprises at least one projection (25) at its inner side on which the roller element (23) or sliding element moves.
41. The device according to any one of claims 37 to 40, wherein the roller element (23) or slide element can give way in case of a relative movement between the drive (2) and take-off (3) when the drive (2) and take-off (3) are not coupled with each other.
42. The device according to any one of claims 38 to 40, wherein the drive (2) and the take-off (3) are configured such that the roller element (23) or sliding element can move inwards in case of a rotation of the drive (2) in that it overcomes the potential of the spring element (24) wherein the torque generated thereby is not sufficient to overcome a mechanical potential at the take-off (3).
43. The device according to any one of claims 37 to 42, wherein a coupling locking element (17) can be positioned between the coupling elements (4) in such a manner that said coupling elements cannot give way and thus the drive (2) and take-off (3) are coupled with each other.

44. The device according to claim 43, wherein the coupling locking element (17) is supported in such a manner that the movement being necessary for the engagement is essentially perpendicular to the attack direction.

5 45. The device according to claim 43 or 44, wherein the mass center of the coupling locking element (17) is selected such that, when the drive (2) and take-off (3) are not coupled with each other, it is essentially supported with regard to its rotational axis that an engagement of the drive (2) and take-off (3) cannot occur in case of accelerations in the attack direction.

10 46. The device according to any one of claims 37 to 45, wherein the coupling locking element (17) is connected to a switch element (30) via a coupling locking spring (18).

15 47. The device according to claim 46, wherein the switch element (30) is operated via the actuator (16) which comprises an electromagnet arrangement (26, 27).

20 48. The device according to claim 46 or 47, wherein the coupling locking spring (18) is arranged and configured such that when the switch element (30) is operated by the electromagnet arrangement of the actuator (16), the coupling locking element (17) can be moved into a position by the coupling locking spring (18) in which the drive (2) and take-off (3) are coupled with each other.

25 49. The device according to claim 46, 47 or 48, wherein the switch element (30) and/or the coupling locking element (17) comprises a switch element spring (31).

30 50. The device according to claim 49, wherein, for coupling, the switch element (30) can be moved via the actuator (16) such that the switch element spring (31) is pre-stressed and that the coupling locking element (17) connected to the switch element (30) can be moved into a coupled position by the spring forces.

51. The device according to claim 50, wherein the movement of the coupling locking element (17) into a coupled position is preferably limited by a stop (33) so that the coupling locking spring (18) can be pre-stressed.
- 5 52. The device according to claim 50 or 51, wherein the pre-stress of the switch element spring (31) is suitable to move the coupling locking element (17) into a decoupled position, when a magnetic force of the actuator (16) is removed from the switch element (30) for a short period of time.
- 10 53. The device according to claim 50, 51 or 52, wherein the pre-stress of the coupling locking element (18) and/or the switch element spring (31) is suitable to release the switch element (30) from the electromagnet arrangement of the actuator (16) for decoupling, when a magnetic force of the actuator (16) is removed from the switch element for a short period of time, especially also when the coupling locking element (17) is still clamped between the coupling elements (4) due to an external torque acting on the drive.
- 15 54. The device according to any one of claims 37 to 45, wherein the coupling locking element (17) and the switch element (30) are configured separately from each other and each comprises a spring element (18, 31).
- 20 55. The device according to claim 54, wherein the switch element (30) is operated via the actuator (16) which comprises an electromagnet arrangement (26, 27).
- 25 56. The device according to claim 54 or 55, wherein the spring elements (18, 31) are arranged such that the switch element (30) holds the coupling locking element (17) in a decoupled position and releases the coupling locking element (17) when it is operated by the actuator (16), so that said coupling locking element can assume a coupled position.
- 30 57. The device according to claim 54, 55 or 56, wherein the coupling locking element (17) is connected to the coupling locking spring (18) and the switch element (30) is connected to the switch element spring (31).

58. The device according to claim 57, wherein the coupling locking element (17) is held in a decoupled condition by the switch element (30) via its switch element spring (31), wherein the switch element spring (31) is pre-stressed.

5 59. The device according to claim 58, wherein the pre-stress of the switch element spring (31) is suitable to release the switch element (30) from the electromagnet arrangement of the actuator (16) for decoupling, when a magnetic force of the actuator (16) is removed from the switch element (30) for a short period of time, especially also when the coupling locking element (17) is still clamped between the coupling elements (4) due to an external torque acting on the drive.

10 60. The device according to any one of claims 37 to 59, wherein the actuator (16) comprises an electromagnet consisting of at least one yoke (26) and a coil (27), wherein the effective direction of the magnetic field between the switch element (30) and the yoke (26) is essentially perpendicular with respect to the attack direction.

15 61. The device according to claim 60, wherein a current is lead through the coil (27) for coupling the drive (2) and the take-off (3), said current effecting a magnetic flux through the yoke (26) and the coupling locking element (17) and/or the switch element (30), which are preferably at least partially magnetically permeable, wherein the coupling locking element (17) is moved such that the roller element (23) or sliding element can transmit a torque onto the take-off (3).

20 62. The device according to any one of claims 9 to 61, wherein the actuator (16) can be operated via a transponder.

25 63. A method, in particular for transmitting a movement as well as corresponding forces and/or moments by means of a coupling, thereby using a device according to any one of claims 1 to 62.

30 64. A lock device comprising a device according to any one of claims 1 to 62.

65. The lock device according to claim 64, wherein the lock device can be operated electrically and/or electromagnetically.
66. The lock device according to claim 64 or 65, wherein the actuator and/or the device  
5 can be operated via a transponder.